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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/833,805	04/12/2001	Akira Arai	9319A-000203	1939

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EXAMINER

SHEEHAN, JOHN P

ART UNIT PAPER NUMBER

1742

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/833,805

Applicant(s)

ARAI ET AL.

Examiner

John P. Sheehan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on February 24 and August 15, 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 and 12-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 12, 13 and 15-18 is/are rejected.
- 7) ☒ Claim(s) 9 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>15&amp;17</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Withdrawal of Allowability***

1. The Examiner acknowledges receipt of the information disclosure statements submitted February 24, 2003 and August 15, 2003. In view of the prior art cited in said information disclosure statement submitted February 24, 2003 the allowance of claims 1 to 9 and 12 to 18 has been withdrawn and the claims are rejected as set forth below.

### ***Information Disclosure Statement***

1. The information disclosure statements filed February 24, 2003 and August 15, 2003 fail to comply with 37 CFR 1.98(a)(3) because they do not include a concise explanation of the relevance, of the documents entitled "Japanese Office Action" and "Korean Office Action" and the document entitled "Communication from corresponding Japanese Application No. 2000-999877" respectively, as presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information. These documents entitled have been placed in the application file, but have not been considered. The Examiner has otherwise considered the information disclosure statements.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 8, 12, 13 and 15 to 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Croat (US Patent No. 4,851,058 cited by the applicants in the IDS submitted August 31, 2001) in view of Toshio et al. (Toshio, Japanese Patent Document No. 09-271909, cited by the applicants in the IDS submitted February 24, 2003).

Croat teaches a method of making a magnetic material having a composition that overlaps the alloy composition recited in the instant claims (column 2, lines 15 to 30). Croat's method comprises melt spinning (column 4, lines 18 to 58), that is, "colliding a molten alloy to a circumferential surface of a cooling roll to cool and then solidify the molten" (applicants' claim 1, lines 2 to 3) and pulverizing or milling the solidified alloy as recited in applicants' claim 18 (Croat's Example 1).

Toshio teaches a cooling roll for manufacturing a ribbon shaped metal alloy material wherein the cooling roll has a grooved surface so as to prevent the formation of air pockets, that is, dimples, produce a more uniform product and to improve the magnetic and mechanical properties of the ribbon metal alloy (English language abstract first paragraph). Toshio teaches that the cooling roll includes a roll base and an outer surface layer as recited in applicants' claim 2. Toshio teaches that the grooves are 0.1 to 50 microns wide and have a depth of about 10 microns or more that overlap the groove width and depth recited in applicants' claims 1 and 12 respectively. Toshio teaches that the angle of the groove relative to the direction of rotation is 20 to 90<sup>0</sup> (paragraph 0012, which overlaps the angle of the grooves recited in applicants' claim 13. In view of Toshio's Figures a-c wherein the grooves extend to the edge of the

cooling roll, Toshio is considered to teach that the grooves have openings located in the peripheral edges of the circumferential surface as recited in claim 16. Toshio teaches that the groove width of 0.1 to 50 microns is such that the molten metal does not enter the groove (See paragraph 0013 of the English language translation submitted by the applicants). Toshio teaches a specific example of a cooling roll having a width of 30 microns and a pitch (interval) of 16 microns (See the English language translation submitted by the applicants, paragraph 0015, line 8). Toshio does not explicitly disclose the ratio of the area of the grooves to the total area of the cooling roll, however the Examiner considers that the ratio of the groove width to the sum of the groove width and groove pitch is equivalent to the ratio of the area of the grooves to the total area of the cooling roll. Based on Toshio's example;

$$\frac{\text{Groove Width}}{\text{Groove Width} + \text{Groove Pitch}} = \frac{30}{16+30} = 0.65 \text{ or } 65\%$$

Thus, this example teaches a groove width of 30 microns and a ratio of the grooves to the total area of the cooling roll of 65% which are encompassed by applicants' claim 1, which recites a groove width of 0.5 to 90 microns and a ratio of the groove area to the total area of the cooling roll encompassed by the instant claim 17's value of 30 to 99.5%. Further, Toshio teaches a groove pitch (interval) of 200 microns or less (paragraph 0014, line 4) that overlap the groove pitch recited in claim 15. Again, Toshio does not explicitly disclose the ratio of the area of the grooves to the total area of the cooling roll, but taking a sampling of groove widths and groove pitches taught by Toshio:

$$\text{Groove Width} = 50 \text{ microns}$$

Groove Pitch = 10, 60, 80, 100 and 200 microns

$$\frac{\text{Groove Width}}{\text{Groove Width} + \text{Groove Pitch}} = \frac{50}{50+10} = 0.83 \text{ or } 83\%$$

$$\frac{\text{Groove Width}}{\text{Groove Width} + \text{Groove Pitch}} = \frac{50}{50+60} = 0.45 \text{ or } 45\%$$

$$\frac{\text{Groove Width}}{\text{Groove Width} + \text{Groove Pitch}} = \frac{50}{50+80} = 0.38 \text{ or } 38\%$$

$$\frac{\text{Groove Width}}{\text{Groove Width} + \text{Groove Pitch}} = \frac{50}{50+100} = 0.33 \text{ or } 33\%$$

$$\frac{\text{Groove Width}}{\text{Groove Width} + \text{Groove Pitch}} = \frac{50}{50+200} = 0.20 \text{ or } 20\%$$

Thus, Toshio teaches ratios of the area of the grooves to the total area of the cooling roll that overlap the ratio of the area of the grooves to the total area of the cooling roll of 30 to 99.5% recited in applicants' claims and groove widths of 0.1 to 50 microns that overlap the groove width of 0.5 to 90 microns recited in applicants' claims.

Croat and the claimed process differ in that Croat does not teach the presence of at least one groove on the cooling roll and Toshio does not teach the exact same values for the cooling roll characteristics as recited in the instant claims. Toshio does not teach the method of making the cooling roll limitation set forth in applicants' claim 8.

However, one of ordinary skill in the art at the time the invention was made would have been motivated to modify Croat's cooling roll to a cooling roll having a grooved surface so as to prevent the formation of air pockets, that is, dimples, produce a more

uniform product and to improve the magnetic and mechanical properties of the ribbon metal alloy as taught by Toshio (English language abstract first paragraph).

Further, the values for the cooling roll characteristics taught by Toshio overlap the instantly claimed the values for the cooling roll characteristics and therefore are considered to establish a prima facie case of obviousness. It would have been obvious to one of ordinary skill in the art to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the Toshio, particularly in view of the fact that;

“The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages”, In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

Regarding claim 8, it is the Examiner's position that the method of making the cooling roll used in the instantly claimed process does not lend patentability to the instantly claimed process of making a magnetic material.

3. Claims 3 and 5 to 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Croat taken in view of Toshio as applied to claims 1, 2, 8, 12, 13 and 15 to 18 as set forth above, and further in view of Fukuno (Fukuno, US Patent No. 5,665,177, cited by the applicants in the IDS submitted June 30,2001).

Croat and Toshio teach and are applied as set forth above.

Fukuno teaches a cooling roll for manufacturing a ribbon shaped metal alloy material wherein the cooling roll has a grooved surface. Fukuno teaches that to minimize variation in the crystal size of the product, that is, to make a more uniform product, the cooling roll is preferably comprised of a base and a surface layer (column 6, lines 65 to 67). Fukuno teaches that the outer surface layer on the cooling roll should have a thermal conductivity lower than the thermal conductivity of the cooling roll base (column 7, lines 1 to 7) as recited in applicants' claim 3. Fukuno teaches a thermal conductivity of the cooling roll outer surface that overlaps applicants' claim 5 (column 7, lines 3 to 6). Fukuno teaches a cooling roll surface layer having a thickness of 10 to 100 microns (column 7, lines 18 to 20), which overlaps the surface layer thickness recited in applicants' claim 7.

The claims and the combination Croat and Toshio differ in that Croat and Toshio do not teach a cooling roll comprised of a base and a surface layer nor do the references teach the thermal expansion coefficient as recited in applicants' claim 6.

However, one of ordinary skill in the art at the time the invention was made would have been motivated to modify Toshio's cooling roll to a cooling roll having a base and a surface coating so as to minimize the variation in crystal grain size and make the product more uniform as taught by Fukuno. Further, the determination of an appropriate thermal expansion coefficient for the surface layer of the cooling roll is considered well within the skill of one of ordinary skill in the art.

4. Claims 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Croat taken in view of Toshio and further in view of Fukuno as applied to claims 3, 5 and 7



above, and further in view of Sukeyoshi et al. (Sukeyoshi, Japanese Patent Document No. 10-317110).

The combination of Croat, Toshio and Fukuno teach and are applied as set forth above. Fukuno additionally teaches that the surface layer for the cooling roll can be chromium (column 6, line 67).

Sukeyoshi teaches that for the purpose of forming the surface layer on a cooling roll chromium and alumina are equivalent, that is chromium and alumina are art recognized equivalents for the same purpose (see the English language Abstract).

The combination of Croat, Toshio in view of Fukuno does not teach the use of a ceramic as the surface layer for the cooling roll.

However one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because Sukeyoshi teaches that chromium and alumina are art recognized equivalents for the same purpose, substitution of art recognized equivalents is obvious, MPEP 2144.06.

#### ***Allowable Subject Matter***

5. Claims 9 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter: None of the references alone or in combination teach or suggest a the process as recited in claim 1 wherein the cooling roll has a surface roughness Ra of 0.05 to 5

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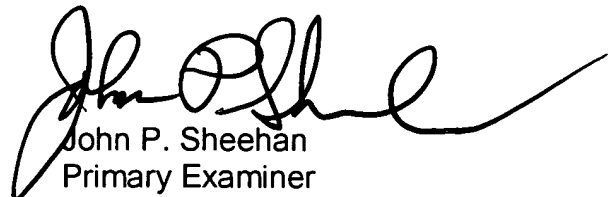
microns where the gas expelling grooves are not provided as recited in claim 9 nor an embodiment wherein the gas expelling groove has a spiral configuration as recited in claim 14.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Sheehan whose telephone number is (571) 272-1249. The examiner can normally be reached on T-F (6:45-4:30) Second Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

  
John P. Sheehan  
Primary Examiner  
Art Unit 1742

jps  
July 20, 2004